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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,159	02/08/2005	Andre Brinkmann	GUL019-225415-PT1	6810
40440 7590 09/18/2007 WOLF, BLOCK, SCHORR & SOLIS-COHEN LLP 1650 ARCH STREET, 22ND FLOOR PHILADELPHIA, PA 19103-2334			EXAMINER LO, KENNETH M	
			ART UNIT 2188	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/524,159	Applicant(s) BRINKMANN ET AL.	
	Examiner Kenneth M. Lo	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/08/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

The instant application having Application No. 10/524,159 has a total of 24 claims pending in the application all of which are ready for examination by the examiner.

### **Oath/Declaration**

1. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in **37 C.F.R. 1.63**.

### **Drawings**

2. The applicant's drawings have been reviewed by the examiner and are found to be acceptable for examination purposes.

### **Information Disclosure Statement**

3. As required by **M.P.E.P 609(C)**, the applicant's submission of the Information Disclosure Statement dated 02/08/2005 is acknowledged by the examiner and the cited reference have been considered in the examination of the claims now pending. As required by **M.P.E.P 609 C(2)**, a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant office action.
4. The listing of references in the specification (page 35-38, titled "References") is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and

MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### **Specification**

5. The specification has been reviewed by the examiner and is found to be acceptable for examination purposes.

### ***Claim Objections***

Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 2 recites "pseudo-random functions". Purely random functions prove to be statistically and mathematically impossible as is well known in the art of cryptography, and indicated throughout Applicant's specifications. It is therefore assumed, by disclosure in multiple locations that randomly is "by means of a (pseudo)random function". Therefore Claim 2 fails to further limit the parent claim limitation of a random function.

**REJECTIONS NOT BASED ON PRIOR ART**

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites elements,  $I_j$  and  $I_k$  where  $I_j$  is a partial space of virtual storage space of each  $S_j$  and  $I_k$  is a partial space contain  $h(i)$ .  $h(i)$  is an element of virtual storage space which is allocated to a data block  $D_i$ . It is unclear to the examiner how  $I_j$  and  $I_k$  are related in relation to the  $S_k$  system and its relation to  $S_j$ . Additionally, if a random element  $h(i)$  of virtual storage space is allocated to each  $D_i$  (step b in claim), it is unclear what Applicant is claiming in step (c) where  $D_i$  is allocated to a storage system represented by  $I_k$ . It is unclear here what the relationship between a random  $h(i)$  space and  $I_k$  space is.

Claim 3 recites  $c_j / \delta$  enclosed in "brackets" (on line 1, 2, and 3 of page 4) however the left bracket and right bracket are non matching. It is unclear to the Examiner what symbol this is representing. Additionally on line 1 of Page 4,  $c_j = \delta$  it is unclear to the Examiner what Applicant implies using a comma in an equation. Additionally, Applicant recites "one partial space  $I_j$  or  $I_k$ ", however if  $I_j$  where  $j=1..n$ , it is unclear how  $I_k$  is differentiated from  $I_j$  or what range  $k$  exists. Furthermore, it is unclear

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what is implied by  $\lfloor^a \rfloor$  in the last line of the claim. Examiner requests the assistance of the applicant in an explanation of the symbols used. Examiner believes to the best of his knowledge that  $\lfloor^a \rfloor$  implies a 'rounding off' or truncation of the variable  $a$ . Further it is unclear what " $a$ " represents or its function in the above equation. Even furthermore, Applicant recites " $a \in 3$ ". Examiner again requests the assistance of the applicant in an explanation of the symbols used. Examiner believes to the best of his knowledge that " $a \in 3$ " implies 'a is an element of the set 3', which appears to mean nothing to the Examiner.

Claim 5 recites a function  $g(j)$ , however this function is not defined within the confines of the claim itself nor its parent claims. As such  $g(j)$  function cannot be determined, and therefore renders this claim indefinite. Examiner cannot present a meaningful prior art rejection to this claim, as elements of the claim are not defined.

Claim 6 recites "the stretch factor". There is insufficient antecedent basis for this limitation in the claim. Further, claim 6 recites "the interval  $[0,1)$ ". There is insufficient antecedent basis for this limitation in the claim. Examiner cannot present a meaningful prior art rejection to this claim, as elements of the claim are not clearly defined.

Claim 7 recites "a number  $h(i) \in [0,1)$ ", however its parent claim states "a random element  $h(i)$ ". It is unclear to the examiner what is meant by the Applicant as to an element and a number in this claim.

Claim 8 recites "correct deviations from the desired distribution". It is unclear to the Examiner what "correct deviations" are interpreted to mean, and what the "desired

distribution" implies. Additionally "the desired distribution" lacks sufficient antecedent basis for this limitation in the claim.

Claim 9 recites "a case that the element  $h(i)$  is allocated to a data block  $D_i$  contained in multiple partial spaces  $I_j$  a uniform placement strategy is applied in order to allocate the data block  $D_i$  to one of the data storage spaces represented by the partial spaces  $I_j$ ". This appears contradictory to the limitation of the parent claim which states "containing  $h(i)$  and allocating the data block  $D_i$  to at least one of the data storage systems  $S_k$  represented by this (these) partial data space(s)  $I_k$  and stored there". Examiner asserts that data block  $D_i$  is being claimed to be allocated to  $I_j$  and  $I_k$  in different parts of the claim. Since there is no stated relationship between  $I_k$  and  $I_j$  it is unclear what the Applicant intends to claim. Examiner cannot present a meaningful prior art rejection to this claim, as elements of the claim are not clearly defined.

Claim 10 recites  $c^{(xxxxxxx)}$  and  $c'=(xxxxxxx)$ . It is unclear to the Examiner what Applicant has claimed in the parenthesis of these two expressions. Applicant is reminded that claims must be presented in a clear and readable manner. Additionally, Examiner is unclear as to the intended meaning of applying a 'superscript' formatting to the equations recited above. Examiner requests assistance in the examination of this claim, by Applicant, and an explanation of its intended meaning.

Claim 11 is rejected as per the same or similar reasons as Claim 10.

Claim 12 is rejected as per the same or similar reasons as Claim 10. Additionally, the use of the "#" symbol in the last line of the claim is not understood by the Examiner.

Examiner requests assistance in the examination of this claim, by Applicant, and an explanation of its intended meaning.

Claim 14 recites "to which is allocated in the table a common physical address on the storage medium". It is unclear what the Applicant is claiming. Additionally Applicant recites "first data block of an extent that consists of  $2^\lambda$  obtaining an address". Examiner is unclear as to what  $2^\lambda$  means without a quantifier or descriptor. Claims also recite "in the form x00... 000". It is unclear as to whether this address represents a hexadecimal, commonly expressed as 0xFFFF, or whether the 'x' in the address represents a 'don't care'. The claim continues to recite "a physical position of a data block is derived adding up of table entries for said extent to  $\lambda$  bits of said logical address of the data block". It is unclear what the Applicant is claiming as their invention. Additionally, as noted from (Paragraph 0086), "The physical position of the data block is obtained by the addition of the table entry for the respective extent and the lower  $\lambda$  bits 7 of the logical address of the data block" where " $\lambda$  bits 7" is represented by the reference to Fig 4. As such the claim may lack enablement under 112 1<sup>st</sup> paragraph as the specification does not disclose how all the  $\lambda$  bits can derive the physical position. Examiner requests assistance in the examination of this claim, by Applicant, and an explanation of its intended meaning. Examiner cannot present a meaningful prior art rejection to this claim, as elements of the claim are not clearly defined.

Claim 16 recites "a controller unit switched in between a computer system and the method for randomly storing data". It is unclear to the Examiner what Applicant is claiming.



Claim 17 recites "at least on the group". This should be amended. Claim also recites "hard drive surfaces". It is unclear to the Examiner what Applicant intends to claim in the limitation "hard drive surfaces".

Claims 2, 4, 13, 15, 18-24 are rejected because of their dependence on an earlier rejected claim.

## **REJECTIONS BASED ON PRIOR ART**

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 7, 8, 10-13, 15-19, 23, 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Hilford V et al. ("EH-Extendible hashing in a distributed environment" 1997).

**As per Claim 1,** Hilford V et al. disclose "A method for randomly storing data on at least one of the group consisting of data storage networks, an intranet, and an Internet, characterized in that a quantity of data blocks  $D_{sub.i}$  ( $i=1, \dots, m$ ) is allocated to a quantity of data storage systems  $S_{sub.j}$  ( $j=1, \dots, n$ ) pursuant to the following steps and stored there:" as [See fig 1 and 2 on page 219] "allocating a virtual storage

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space to an overall quantity of data storage systems and at least one partial space  $I_j$  of the virtual storage space to each individual data storage system  $S_{\text{sub}.j}$  ( $j=1, \dots, n$ ) by an initial random process, whereby the relationship between the partial space  $I_{\text{sub}.j}$  and the overall virtual storage space at least approximately matches the relationship of the values of a presettable parameter relating to the data storage system  $S_{\text{sub}.j}$  or the overall quantity of data storage systems" **[See Paragraph 3.3]** "allocating a (random) element  $h(i)$  of the virtual storage space to each data block  $D_{\text{sub}.i}$  ( $i=1, \dots, m$ ) by means of a second random process" **[See paragraph 3.1]** "determining for each data block  $D_{\text{sub}.i}$  ( $i=1, \dots, m$ ) at least one partial space  $I_{\text{sub}.k}$  containing  $h(i)$  and allocating the data block  $D_{\text{sub}.i}$  to at least one of the data storage systems  $S_{\text{sub}.k}$  represented by this (these) partial data space(s)  $I_{\text{sub}.k}$  and stored there" **[See paragraph 3.3]**.

**As per Claim 2-3, 7, 8, 10-13, 15-19, 23, 24**, Hilford.V anticipates these claims as per International Search Report mailed 28/01/2004, in application PCT/EP 03/08635, on page 219, Column 2, paragraph 3.1 – page 220, Column 2, Paragraph 3.4 and Figures 1-4.

10. Claims 1, 2, 4, 7, 8, 15-17, 23-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Karger et al. ("Consistent hashing and random trees: Distributed caching protocols for relieving hot spots one the World Wide Web" 1997).

**As per Claim 1**, Karger et al disclose "A method for randomly storing data on at least one of the group consisting of data storage networks, an intranet, and an Internet,

characterized in that a quantity of data blocks  $D_{sub.i}$  ( $i=1, \dots, m$ ) is allocated to a quantity of data storage systems  $S_{sub.j}$  ( $j=1, \dots, n$ ) pursuant to the following steps and stored there:" as **[See paragraph 1.1]** "allocating a virtual storage space to an overall quantity of data storage systems and at least one partial space  $l_j$  of the virtual storage space to each individual data storage system  $S_{sub.j}$  ( $j=1, \dots, n$ ) by an initial random process, whereby the relationship between the partial space  $l_{sub.j}$  and the overall virtual storage space at least approximately matches the relationship of the values of a presettable parameter relating to the data storage system  $S_{sub.j}$  or the overall quantity of data storage systems" **[See Paragraph 1.1-1.3]** "allocating a (random) element  $h(i)$  of the virtual storage space to each data block  $D_{sub.i}$  ( $i=1, \dots, m$ ) by means of a second random process" **[See paragraph 1.1]** "determining for each data block  $D_{sub.i}$  ( $i=1, \dots, m$ ) at least one partial space  $l_{sub.k}$  containing  $h(i)$  and allocating the data block  $D_{sub.i}$  to at least one of the data storage systems  $S_{sub.k}$  represented by this (these) partial data space(s)  $l_{sub.k}$  and stored there" **[See paragraph 1.4]**.

**As per Claim 2, 4, 7, 8, 15-17, 23-24**, Karger anticipates these claims as per International Search Report mailed 28/01/2004, in application PCT/EP 03/08635, on page 6 Column 2, paragraph 4.2.

***Claim Rejections - 35 USC § 103***

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Karger et al. ("Consistent hashing and random trees: Distributed caching protocols for relieving hot spots one the World Wide Web" 1997).

**As per Claim 20,** Karger et al disclose "The arrangement according to claim 15" as **[See rejection to Claim 15 above]** "characterized in that the method for randomly storing data is implemented as a hardware RAID method in a controller unit" **[It is well known in the art that RAID can be used to distribute data across multiple disks. It is also well known to one of ordinary skill that the method to which RAID stripes the data across disks is done in pseudo random.]**

**As per Claim 21,** Karger et al disclose "The arrangement according to claim 15" as **[See rejection to Claim 15 above]** "at least one dedicated computer system that is linked via data exchange means with storage media and computer systems for coordinating storing of data and/or processor resources linked via means for data exchange with storage media and computer systems for distribution of data blocks" **[It is well known to one of ordinary skill in the art, that data storage systems have means of which to exchange data with its storage media. This is a core aspect of data storage.]**

**As per Claim 22**, Karger et al disclose "The arrangement according to claim 15" as **[See rejection to Claim 15 above]** "characterized in that the arrangement includes heterogeneous storage media" **[It is very well known to anyone of ordinary knowledge in the art of data storage that storage media can be arranged in heterogeneous fashion.]**

## **CLOSING COMMENTS**

### **Conclusion**

#### **STATUS OF CLAIMS IN THE APPLICATION**

13. The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. 707.07(i)**:

#### **CLAIMS REJECTED IN THE APPLICATION**

14. Per the instant office action, **Claims 1-24** have received a first action on the merits and are subject of a first action non-final.

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15. The examiner requests, in response to this Office action, support be shown for language added to any original claims on amendment and any new claims. That is, indicate support for newly added claim language by specifically pointing to page(s) and line no(s) in the specification and/or drawing figure(s). This will assist the examiner in prosecuting the application.

16. When responding to this office action, Applicant is advised to clearly point out the patentable novelty which he or she thinks the claims present, in view of the state of the art disclosed by the references cited or the objections made. He or she must also show how the amendments avoid such references or objections See 37 CFR 1.111(c).

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth M. Lo whose telephone number is 571-272-9774. The examiner can normally be reached on Mon - Thu (7:30am - 6:00pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung Sub (Sam) Sough can be reached on 571-272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kenneth Lo  
Art Unit: 2188

  
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SUPERVISOR  
9/14/07